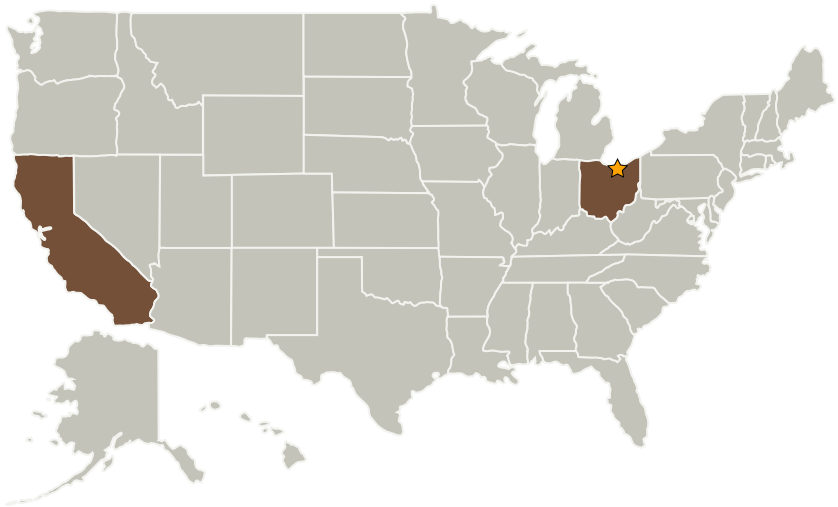
# Hybrid Nanocomposite Photovoltaics, Phase I

Completed Technology Project (2004 - 2004)

## Project Introduction

This Small Business Innovation Research Phase I project will develop an innovative solar cell design that combines nanotechnology with conducting polymer photovoltaics to achieve extremely low weight, flexible solar cells of almost any size and shape that far surpass current solar cell efficiencies. This proposal demonstrates the potential of this design for increased efficiency and low weight by prototyping single-layer solar cells (compatible with future tandem-cell architecture) with spectral responses tuned to the solar spectrum. The project develops approaches to explore the four main technical areas that are currently limiting nanocomposite photovoltaic cell performance: illumination intensity saturation, conduction efficiency, charge-separation efficiency and dispersion control of nanomaterials in a host matrix at high concentration. In Phase I, these technical areas are explored to determine the magnitude of potential performance improvements that can be achieved by optimizing these parameters in Phase II, and compare these projections to the maximum performance predicted by theory. In Phase II, the information gathered in Phase I will be used to produce a prototype of an optimized, lightweight, low-cost, flexible solar cell with efficiency greater than 15%; amenable to large-scale, low-temperature manufacturing and eventual transition to tandem-cell designs for efficiency > 30%.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Glenn Research Center (GRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Glenn Research Center(GRC) | Lead Organization | NASA Center | Cleveland, Ohio |
| Nanosys, Inc. | Supporting Organization | Industry | Palo Alto, California |

| Primary U.S. Work Locations | |
|---|---|
| California | Ohio |

## Project Management

**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Andreas Meisel

## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic